Introduction

Osteoporosis, the most commonly occurring metabolic bone disease, affects 25 million Americans. The annual medical cost of this disease is about $13.8 billion - and the cost in human suffering and lost productivity is incalculable. The most prominent burden of osteoporosis is hip and spine fractures. Estimates made as recently as 1985 that the number of such fractures in the United States would increase from 250,000 in the 1980's to 650,000 by the year 2050 have already been challenged as an underestimate because the elderly population has been growing faster than expected. Not surprisingly, the economic toll is rising. Consider the following facts:

- The National Osteoporosis Foundation estimates that 10% of Michigan's population -- 810,200 women and 137,800 men -- suffer from osteoporosis.
- Over the next 20 years, the cost of hip, wrist and vertebral fractures will be about $7.1 billion in Michigan.
- Between 1995 and 2015, 164,000 Michigan women, age 45 and older, are expected to suffer hip fractures. Of these same women, 36,080 will suffer additional hip, spine and wrist fractures.
- The annual cost to Michigan's health care system for care related to osteoporosis is expected to rise from $172 million in 1995 to $569 million in 2015, given the present incidence of osteoporosis-related fractures.

Osteoporosis and a related condition, osteopenia, will affect about one in three state residents during their lifetime. In 1996, there were 9,738 hip fractures in Michigan, according to the Michigan Resident Inpatient Hospital Database. The average medical care cost for each hip fracture was estimated to exceed $35,000. The medical care costs of hip fractures, of course, represent only a small fraction of the true burden of this disease. Dollar values cannot be assigned to the pain and suffering caused by osteoporosis.

It is widely believed that osteoporosis and osteopenia afflicts primarily the elderly - especially post-menopausal women - or a few unique individuals. This is not so. Rather, these conditions are the consequence of the interactions of a lifetime of behavioral, developmental and genetic factors and can affect both women and men at all stages of life. This makes it impossible to develop a single, simple intervention that can be expected to have a major impact on the public health.

Still, a focused and well-conceived public health program that uses resources and programs already in place can do much to reduce the

prevalence of these diseases. In fact, with the recent development of accurate screening and effective pharmacological interventions, there is now a potential for prevention of disability due to osteoporosis and related conditions that did not exist even a decade ago.

The Michigan Osteoporosis Planning Group was convened by the Michigan Department of Community Health to develop a focused plan that will result in a decrease in the rates of osteoporosis and the number of osteoporosis-related fractures in the state=s population.

This report of the Michigan Osteoporosis Planning Group is the product of the group's intense and dedicated six-month effort. The report outlines the background, issues, and risk factors for each of three age groups (children and youth, young adults [age 21 to menopause], and mature adults). It makes specific recommendations pertaining to educating the public and providers, professional consensus building, environmental changes, quality assurance, screening of target populations, and a wide range of prevention initiatives.

An overview of metabolic bone disease (osteoporosis, osteomalacia and Paget's disease) and issues related to establishing healthy bones throughout the life course is included in Appendix B.

Section I: Cross-Cutting Recommendations

Educating the Public

Focus statement:

The scientific and health care communities have learned a great deal in recent years about osteoporosis, the primary metabolic bone disease. As noted in the introduction, the magnitude of the human and economic costs attributable to this disease have become increasingly clear. We have also learned that osteoporosis and osteopenia are not diseases of the elderly or of a few unique individuals. Rather, these conditions are the consequence of the interactions of a lifetime of behavioral, developmental, and genetic factors and can affect both men and women throughout their lives.

The general public, however, still thinks of osteoporosis mainly as a condition that affects women of menopausal age and older. For most people, the term evokes only the image of a bent-over elderly woman.

The strategy of a public education program must be to bring many more people into the osteoporosis picture B in other words, to show that osteoporosis-related issues affect patients of many ages, their families, employers, and health providers. The first task is to provide accurate, meaningful information about osteoporosis to a wide range of groups, including teachers, parents, children, patients, health care providers, and care givers. Only when armed with a clear understanding of the basic mechanisms of osteoporosis, how it develops, and whom it affects will the general public be persuaded to adopt behaviors that will enable them to prevent osteoporosis or, at the least, to reduce its devastating effects.

Recommendation 1:

To address the critical need for accurate, and persuasive information about osteoporosis, the Michigan Osteoporosis Planning Group recommends beginning not later than the year 2000 the implementation of a statewide, multi-year, multi-channel, intergenerational, racially and ethnically sensitive public awareness initiative that will provide appropriate education about osteoporosis to:

Those at greatest risk for osteoporosis;
Those with the opportunity to prevent osteoporosis through lifestyle changes; and
Those most likely to benefit from screening and intervention.

The goal of the public education initiative is to create a broad, accurate public awareness of what osteoporosis is and that:

Osteoporosis potentially affects every citizen;
Osteoporosis can be prevented, diagnosed and treated;
There are established risk factors for developing osteopenia and osteoporosis;
There are available prevention, screening, and treatment services; and
It is important to take individual responsibility for bone-healthy lifestyles and behaviors.

Specific public awareness approaches and strategies tailored to each age group should be employed

Projected impact:

Among young children, the initiative will increase awareness of the importance of good nutrition and physical activity in building healthy

bones and bodies and will lay the groundwork for continuing these healthy behaviors into adulthood. The initiative will provide healthy

choices to adolescents and young adults to make osteoporosis prevention seem attractive and a choice that young people can make on their own. Finally, among adults, the initiative will increase awareness of osteoporosis prevention measures and of an individual=s risk for osteoporosis and will increase the likelihood that individuals will actively work to lower that risk.

Detailed recommendations specific to various age groups appear in the three age-specific sections below.

Educating Providers

Focus statement:

Osteoporosis is often the result of lifestyle choices or is secondary to another condition such as thyroid problems, corticosteriod therapy, estrogen deficiency, or immobility. Therefore, risk factor evaluation coupled with appropriate diagnostic tools (such as measuring bone mass density) make it amenable to prevention and treatment. In short, osteoporosis should not be considered an inevitable condition.

However, many health care providers do not recognize that osteoporosis is a condition that should be of concern to their patients, regardless of age. People do not generally associate the period from birth to age 20 with osteoporosis, but this is in fact a time in which events can occur that interfere with the optimal accumulation of bone mass and subsequently increase the risk for fractures. Adolescents, for example, can feel pressured to attain a desirable body type, trying to meet artificial norms for a slim body shape that is unrealistic for most youth. If this takes the extreme form of anorexia nervosa and remains untreated, it can result in bone loss estimated at 4-10 percent per year. Young adults and middle-aged people of both sexes need to be informed of the need to maintain adequate bone mass through proper diet and physical activity. Health care providers should be prepared to address a wide range of issues, from hormone therapy to diet and behavioral interventions, to achieve this goal. If anything, this need becomes more immediate in mature adults.

The goal of any provider education program must be to deliver information that is accessible and usable and addresses succinctly the key issues of osteoporosis prevention, screening, and treatment at various life stages. We have made significant advances in our understanding of osteoporosis. Once a person has been determined to be at high risk for osteoporosis or is diagnosed with osteoporosis, there are many paths to

effective prevention or treatment. The task at hand is to equip health care providers with the information they need to address a disease whose costs include significant health care dollars and lost productivity B not to mention patient

suffering and death. It is important that providers understand that they can prevent massive needless suffering.

When public information initiatives are successful at informing the public about their risk of osteoporosis, patients will turn more frequently to their health care providers for information. However, osteoporosis prevention and treatment are not always covered in professional training or continuing education courses. To prepare Michigan health care professionals for their crucial role in preventing and treating osteoporosis in the coming years, the Michigan Osteoporosis Planning Group recommends a multi-faceted plan for the education of health care providers.

Recommendation 2:

The Michigan Osteoporosis Planning Group recommends that the Michigan State Medical Society, professional associations representing physicians, physician assistants, nurses, nurse practitioners, dietitians, exercise specialists, other allied health professionals, the Michigan Consortium for Osteoporosis and the Michigan Department of Community Health collaboratively establish strategies for increasing the awareness and the skill level of all Michigan health care providers in the areas of osteoporosis prevention, risk factor identification, diagnosis, and treatment.

The most effective means of delivering information to each provider group may include such methods as:

- A curriculum and multi-media presentation for the education of public health, health care, and bone density measurement providers;
- State-of-the-science physician and patient education materials;
- Continuing Medical Education courses on osteoporosis prevention, screening, and treatment;
- Journal articles, professional publications, and monographs on emerging osteoporosis prevention, screening, and treatment; and
- Other approaches judged to be effective such as periodic mailings from respected medical centers, distribution of laminated pocket cards summarizing treatment guidelines,

and distribution of the Physician-based Assessment and Counseling for Exercise (PACE) materials developed by the Centers for Disease Control and Prevention.

To further educate health care providers about osteoporosis, each association of health professionals in Michigan should:

Help disseminate treatment guideline recommendations of the Michigan Osteoporosis Consensus workgroup (see Recommendation 5).
Help inform its members of the availability of accurate patient education materials (see Recommendation 5).
Help inform its members of the availability of validated risk factor assessment tools (as they become available) which can be used with their patients.
Create and publish a professional position statement on the importance of appropriate osteoporosis risk assessment, prevention, and referral for its members.
Include osteoporosis education in continuing education events organized by the association and in educational bulletins or newsletters routinely mailed to its membership.
Include, as appropriate, osteoporosis education in established Continuing Medical and Professional Education course material.

The professional education approaches and strategies that are specific to each age group are recommended in the age-specific sections of this document.

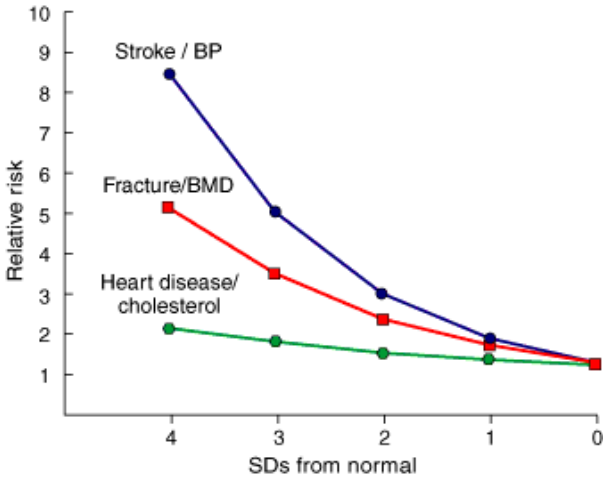
Projected impact:

Increasing health care providers= awareness of osteoporosis as a major public health problem and of the availability and appropriate use of detection devices and treatments will decrease the incidence of osteoporotic fractures in the mature adult population as it ages. Furthermore, health care providers will be able to diagnose and treat more than the small proportion of cases that are currently identified and treated. They will be able to do much more to prevent low bone mass and excessive bone loss in the next generation. Finally, increasing the number of providers who discuss bone health with their patients will increase patient awareness, lead to reduction of risk factors, and contribute to prevention.

Quality Assurance

Focus statement:

Current diagnostic technology enables providers to predict a fracture due to osteoporosis more reliably than they can predict the occurrence of a heart attack, but this reliability depends on the maintenance of precise and accurate instrumentation along with correct interpretation of data. Without some ongoing quality assurance, there are bound to be incorrect interpretations and recommendations. These may undermine our ability to treat this disease effectively and may lead to unnecessary suffering.



Relationship between relative risk of condition and deviation from the young normal mean for stroke and blood pressure, fracture and bone mineral density and coronary heart disease and cholesterol (adapted by Need from Marshall et al. 1996; in Osteoporosis Consensus Statement MJA, 1997.)

The issue is less the quality of the machines or the competence of their operators than the lack of accepted voluntary standards or quality control for the technology available. Further, third-party payers are appropriately reluctant to pay for screening tests that may not be accurate and may not measure risk of fracture.

Finally, beyond the lack of standards for machines, there is a lack of uniform, regular training and refresher courses for the physicians and others who read, interpret, and act on test results. A voluntary system of provider education, perhaps with incentives such as Continuing Medical Education credits, might be more appropriate than a mandatory regulatory system.

Recommendation 3:

The Michigan Osteoporosis Planning Group recommends that Michigan establish a collaborative process (with participation from the Michigan Department of Consumer and Industry Services, the Michigan State Medical Society, medical and health care

professional associations, Michigan Department of Community Health and the Michigan Consortium on Osteoporosis) to develop **by 2002, voluntary self-certification and standards of excellence for bone density measurement providers.**

The standards should address:

Equipment calibration, accuracy, and safety.
Training and supervision of individuals conducting and evaluating bone mineral tests.
Limits for exposure to ionizing radiation.
Minimum elements of written reports to the referring physician and patient, to include the level of risk for bone fracture and other adverse events.

Projected impact:

Having a self-certification process and standards of excellence for bone density measurement providers will increase likelihood that equipment used for conducting bone mineral density and other osteoporosis-related tests will be reviewed regularly and evaluated specifically in connection with its use for these purposes. Those who provide bone density measurement tests and those who interpret the results of these tests will be more likely to be qualified according to an accepted standard. The most important results of these measures will be to increase the credibility and accuracy of test reports and to improve the quality of care rendered to patients. The measures will also serve to facilitate third-party payer recognition and to provide test sites with quality safeguards they do not currently have.

Environmental Interventions

Focus statement:

Educational efforts are not enough to avert the expected epidemic of bone fractures in the early 21st Century. Michigan=s social and physical environment has many barriers that make it difficult for individuals to perform the two most basic preventive measures for osteoporosis: frequent moderate exercise and a consistent diet of bone-healthy foods. These barriers must be removed. Such environmental changes may require a longer-term investment of effort and resources than other prevention interventions. However, their proven impact and on-going benefit strongly support their inclusion in Michigan=s long range osteoporosis prevention plans.

Recommendation 4:

All Michigan communities should work to remove any potential structural and environmental barriers that prevent or discourage Michigan citizens from maintaining optimal bone-healthy diets and engaging in regular moderate exercise. Examples of these environmental interventions can include:

> **Restaurant Menus - The Michigan Department of Community Health, the Michigan Arthritis Association, the Dairy Council of Michigan, the Michigan Dietetic Association and state associations of restaurant owners and chefs could design and recommend a statewide voluntary restaurant menu labeling and identification program for food choices that are consistent with bone health**.

The objective of the program would be to increase the number of bone-healthy foods offered in restaurants and to help patrons make educated menu choices. The system could build on existing menu projects already sponsored by the American Heart Association, M-FIT, St. Joseph Mercy Health System, and others and should include incentives for participation, methods for recognizing participation and appropriate menu content.

> Community Awards - An award and recognition program should be created for communities that make it easier for their residents to be physically active.

Representatives of the Governor=s Council on Physical Fitness, Health and Sports, the Michigan Recreation and Parks Association, the Department of Transportation, the Department of Natural Resources, and private organizations such as the Michigan League of Bicyclists, the Michigan Chamber of Commerce, and the Rails to Trails Conservancy should collaborate to develop a comprehensive inventory of actions that can be taken by local communities that would make it easier for people in the communities to be physically active. This self-assessment inventory could serve as the foundation for a system of recognition for communities and could be included as part of the Governor=s Council on Physical Fitness, Health and Sports Awards Program. The self-assessment inventory could include topics like zoning policies, pedestrian transportation routes, and availability of school and other community facilities for the general public.

> Increased Use of Malls for Walking - The Governor's Council on Physical Fitness

Health and Sports and the Michigan Office of Services to the Aging should design a model program to be implemented cooperatively by

regional fitness councils and local senior citizen centers for expanding use of shopping malls for walking programs.

The model program could include sample letters to mall management, sample incentive items for walkers such as food and beverage coupons from food vendors typically found in Michigan malls, copies of agreements from major food chains to cooperate in such programs, and sample mileage charts and signage.

> Foods in Public Places and Educational Institutions - Food managers of public spaces and educational institutions should make bone-healthy foods available. And, because a significant number of individuals do not consume dairy products, both dairy and non-dairy sources of calcium should be included.

There are a number of ways to achieve this goal. These include: 1) encouraging all schools to offer beverages and foods that contribute to bone health; 2) incorporating bone healthy food choices at work sites; and, 3) working with Michigan colleges and universities to make bone-healthy foods available in vending areas serving college students.

Projected impact:

Removing barriers that exist in communities to physical activity can increase the ongoing physical activity of community residents. Likewise, removing barriers to the awareness of which foods are healthy and the promotion of the easy availability of healthy foods has been shown to affect their consumption. Removal of environmental barriers to bone health will complement educational efforts, and will make lasting behavioral change more likely.

Infrastructure and Consensus Development

Focus statement:

There is no central coordination of current efforts in Michigan to reduce the incidence and prevelance of osteoporosis. Similar to the state and local health partnerships which are helping to reduce blood pressure and cholesterol, we need to form collaborative health partnerships to help increase and maintain bone density. Partnerships must be formed among a wide range of constituencies including those directly affected by the disease. Health care providers and health educators, teachers and coaches from elementary school through college, community agencies, local resource planners and others who are in a position to have an impact on

osteoporosis-related efforts in a variety of ways can and should find new ways to effectively collaborate and cooperate.

It should be made clear to insurers, benefit payers, corporations, unions and community health organizations that they will also directly benefit from an effective statewide response to the prevention and treatment of osteoporosis.

Many of the recommendations in this report call for these types of collaborative public-private partnerships. Ultimately, such partnerships will help to extend the limited state resources available for the implementation of this initiative and help to magnify the impact of Michigan=s collective efforts. Michigan needs a coordinated, collaborative effort to provide a more unified, statewide focus on the issues raised in this report and to provide leadership in forming the partnerships needed to ensure full implementation of the recommendations made in this document.

Recommendation 5:

The Michigan Osteoporosis Planning Group recommends the establishment of a Michigan Collaborative Osteoporosis Partnership (MCOP) between the Michigan Consortium on Osteoporosis, Michigan Department of Community Health, and other appropriate organizations. This partnership would develop the consensus program priorities and collaborative program resources for the timely accomplishment of the recommendations made in this report.

The Michigan Collaborative Osteoporosis Partnership could carry out its functions through mutually-agreed strategic contractual and collaborative working agreements.

Activities of the Michigan Collaborative Osteoporosis Partnership should include:

> MCOP could continue the process of developing a Michigan consensus regarding the prevention and treatment of osteoporosis. A consensus development expert work group panel should be convened, consisting of official representatives of all medical and other health professional organizations that have roles in patient screening, education, and treatment for osteoporosis. The work of the consensus expert work group would include:
>
> > A review of published consensus documents such as Guidelines of Care on Osteoporosis

for the Primary Care Physician, published in fall of 1998 by the Foundation for Osteoporosis Research and Education, with assessment of the acceptability of those guidelines to Michigan provider groups.

The development of clear recommendations concerning which individuals are appropriate candidates for bone mass density measurement and what technology is appropriate for case-finding and individual patient monitoring. These recommendations should address two categories of individuals: those with medical conditions and medications which by their nature reduce bone mineral density, and those with multiple risk factors for osteoporosis; and

The delineation of the roles of all health professionals in risk factor assessment, preventive counseling, referring patients for diagnosis and treatment, and, where appropriate, providing therapies for osteoporosis patients.

MCOP should support subcommittees as needed to monitor foundation and federal grant initiatives, research opportunities, and other developing trends in osteoporosis prevention, screening and treatment.

MCOP should create an expert workgroup to review the needs of special populations at high risk of developing osteoporosis such as the disabled, children with special developmental needs, and those with other health problems which prevent proper diet and exercise since these issues were not addressed by the planning group. This workgroup should report its findings to the MDCH and MCOP by January 2000.

MCOP should create an expert workgroup to review the needs and available services for osteoporotic fracture patients including medical services, rehabilitation services, social services and employment issues. This workgroup should report its findings to MDCH and MCOP by January 2000.

MCOP should create and support periodic osteoporosis information and educational programs for health care leaders, decision-makers, and program leaders regarding osteoporosis prevention, diagnosis, and treatment and its long-term cost implications. These programs should include conferences, fact sheets, position papers, and program analyses.

MCOP should facilitate the provision of professional consultation and input for the identification and preparation of community, foundation, and research grants related to osteoporosis.

MCOP should participate with existing MDCH mechanisms to review the accuracy of patient education materials available for use by the public. The review function would be similar to the materials review process used by the Michigan Model and the Health Promotion Resource Center for other health materials and assist health care providers in objectively choosing among the wide array of pamphlets, films, and other materials that are made available by drug companies and private health education companies.

MCOP should establish a plan for increasing the interaction between osteoporosis-related prevention programs and community health planners, community public and private facility directors, and county, township, and city government health and recreation programs. The goal of the plan is to enlist the support of these individuals and agencies in removing environmental barriers and providing increased access to sites that are appropriate for physical activity and to nutrition, community information and educational resources that can support osteoporosis- related initiatives.

MCOP should develop methods for the dissemination of the Michigan Osteoporosis Strategic Plan and the resulting recommendations and materials of the MCOP.

Projected impact:

The Michigan Collaborative Osteoporosis Partnership can have a significant positive impact on statewide efforts to coordinate and deliver

osteoporosis risk assessment, screening, detection, and treatment. Without it, Michigan will continue to experience a fragmented, duplicative, and uncoordinated response to our growing osteoporosis crisis. The establishment of clear voluntary guidelines for screening and risk assessment and the definition of the roles of health professionals involved at various stages of this process will help to ensure optimal health provider practice, and help to improve patient awareness. Other mechanisms established under this recommendation will assure that Michigan professionals and community leaders remain in communication with each other and with their counterparts at the national and international levels. This will improve Michigan=s ability to keep up with the emerging science and practice of osteoporosis prevention and treatment, to take advantage of research and grant opportunities, and to monitor and stay abreast of developing trends.

Evaluation

Focus statement:

Michigan cannot afford to devote resources to the critical problem of osteoporosis without also developing a way to evaluate our efforts. Therefore, establishing a reliable means of gathering and evaluating appropriate data must be a concern at the outset. To begin with, it is necessary to recognize that there is a lack of verifiable information about current citizen knowledge of osteoporosis and related issues. Baseline data must be gathered if we are to determine where educational, prevention, and treatment efforts should be targeted for greatest effect. The same data will enable us to evaluate the efficacy of those efforts. Michigan will also need to periodically assess accurately the incidence and prevalence of osteoporosis risk factors and low bone density. Other measurement instruments must be developed to gauge the efficacy of health care provider practices.

Data will not only guide osteoporosis education, prevention, and screening efforts but will also be invaluable in related areas. It will help in securing Michigan's share of funding from federal agencies, private foundations and other sources to continue and expand these efforts in future years.

The evaluation component of Michigan=s osteoporosis initiative should make full use of the state=s universities and medical schools and the University of Michigan School of Public Health in establishing and maintaining the data bases needed to gauge the need for programs and to evaluate their efficacy.

Recommendation 6:

Michigan should establish ongoing surveys or other means of measuring:

- The current knowledge of Michigan residents concerning bone health and associated risk behaviors;
- Health provider counseling, screening, and treatment practices and how closely they adhere to the emerging national and Michigan osteoporosis practice consensus recommendations.
- Trends in Michigan osteoporosis-related fracture rates and related bone densities.
- Michigan residents' awareness of physical activity needs, nutrition needs, nutrition habits and deficiencies that are relevant to osteoporosis.

When necessary, supplementary evaluation instruments should be developed to enhance existing Michigan bone density measurement studies or databases or to validate emerging screening tools and sampling techniques. The information gathered through these means should be made available to insurers, payers, and health policy makers.

Projected impact:

Implementation of this recommendation will do much to ensure that Michigan public health and health care communities have a full understanding of the osteoporosis-related needs of the Michigan public. It will enhance Michigan's ability to provide appropriate education and earlier, more effective identification and treatment of this disease, and will encourage the adoption of appropriate health insurance and reimbursement benefits.

Careful use of the data generated through provider surveys will ensure that health care professionals have access to and utilize both proven methods and technologies and emerging, cost-effective osteoporosis screening and treatment techniques. The establishment of regular data-gathering channels and the periodic evaluation of progress in achieving osteoporosis-related tasks will do much to foster a close and effective partnership among providers, researchers, patients, insurers, payers, and funders of research.

Section II: Children and Youth

Educating the Public

Public education that would affect the bone health of children could occur in three distinct areas: media, patient and parent education, and sports organizations and coaches.

Media Campaigns

Focus statement:

Osteoporosis can be thought of as a disease of old age with clear pediatric antecedents. Bone mass is accumulated during childhood and young adulthood, reaching its peak during a person=s early 20's. Therefore, osteoporosis prevention efforts must be initiated when children are very young and must continue into early adulthood. In order to be effective, these efforts must be broad-based and should flow from a variety of sources, such as the media, parents, educators, and health care providers. Because children and youth spend a great deal of time watching television and listening to the radio, it makes sense to utilize media messages to convince children and youth to build strong and healthy bones.

Recommendation 7a:

Michigan should develop a multi-method media osteoporosis prevention campaign that targets children and youth in specific age ranges. This campaign should be developed in three phases with the following components:

Children younger than 12 years old:

> The public health community and the dairy industry should develop a media campaign that uses a message or messages that promote adequate diet and weight bearing exercise. A famous person easily identified by children, possibly a sports figure should be considered to promote building healthy bones. These messages should be aired during after-school and weekend hours when children are at home and watching television.
> Other media approaches (library newsletters and reading programs, children's magazines, etc.) that use elements of the same campaign should also be explored, including bone health-related software (or a game) that could be used at health fairs in schools or in malls.
> Development of these campaigns should be preceded by research into the techniques and effectiveness of similar campaigns, such as the Willie Munchright animated series

on healthy eating that airs during Saturday morning cartoons (this was a collaborative effort between McDonald's and the Society for Nutrition Education).

Youth 12-16 years old:

The approach should be the same as for the younger group except that additional collaborators other than the dairy industry might also be enlisted. The famous figure should be someone more readily identified by this age group. A campaign directed at females would be useful.
The focus should be on building healthy bones and bodies; messages can be more nutrition- and activity-oriented, and can be slanted toward the issues that this age group considers important (physical attractiveness, making independent decisions, etc.).
Other media can be explored (magazines that target teens, for example), and bone health-related software (or a game) can be developed for use at school health fairs or in malls.

Youth and Adults 17-20 years old:

A priority should be placed on reaching females. The designers of the campaign should investigate the possibility of finding more age-relevant collaborators and should use print, electronic, and other media that target this age group. Prevention of osteoporosis can be made a more decisive element of the campaign directed to this age group. One possibility would be to show individuals 16-18 years old, then represent them as 50-year-olds, 60-year-olds, and finally as 70-year-olds with severe osteoporosis and a noticeably stooped appearance. This segment of the campaign should focus on what a person can do now to prevent bone deterioration.

Projected impact:

The media campaigns outlined above will increase awareness of the importance of good nutrition and physical activity in building strong and healthy bones, including how to do it, and should create recognizable themes that children and young adults will retain for years. This can lay the groundwork for continuing these healthy behaviors into early adulthood and beyond.

For teenagers, the campaign should increase awareness of an individual=s risk for osteoporosis; increase the likelihood that individuals in this age

group will actively work to lower their risk for osteoporosis; provide healthy choices that allow teens to increase bone mass; and make osteoporosis prevention seem attractive and a choice they can make on their own.

Patient and Parent Education

Focus statement:

The American Academy of Pediatrics (AAP) recommends that children receive preventive pediatric health care services 10 times between birth and age 2 years, then annually until age 21. Anticipatory guidance that includes nutritional counseling is an integral component of preventive health care services, according to the AAP. Parents and children should also be asked about motor development and physical activity and given guidance encouraging regular physical activity and discouraging passive activity such as watching television. Physical inactivity has been associated with osteoporosis whereas weight-bearing activities have been associated with reduced risk for osteoporosis.

The American Medical Association recommends that all adolescents receive annual guidance about dietary habits, including the benefits of a healthy diet, ways to achieve a healthy diet, and the benefits of physical activity and safe exercise programs. The Put Prevention Into Practice program developed by the United States Public Health Service (1994) recommends that primary care providers counsel parents, children, and adolescents about proper nutrition, and a report of the United States Preventive Services Task Force (1996) cites reduced calcium intake as a risk factor for bone mineral loss and osteoporosis.

Recommendation 7b:

Beginning in the year 2001, Michigan should increase the number of primary care providers who provide all parents and children age-appropriate nutrition counseling at each preventive health care visit including the role, importance, and recommended daily intake of calcium and Vitamin D by 20% annually. All parents and children should also receive information and counseling concerning age-appropriate physical activity, and suggestions for appropriate types and amounts of activity.

Projected impact:

Primary care providers are in a unique position to deliver important osteoporosis-related health messages to children, youth and their parents. By targeting providers, the public health and health care communities can ensure that parents and children can be educated on the importance of

consuming adequate calcium and Vitamin D, and of physical activity in improving bone health. This will serve to reduce the short- and long-term bone health problems of the youngest members of the general public B and perhaps of their parents as well.

Sports Organizations and Coaches

Focus statement:

The Michigan State University Youth Sport Institute estimates that about 335,000 Michigan children 7 - 10 years old are active in community sports programs and they are guided by about 28,000 coaches. The proportion of children involved in community sports drops after age 10. A number of sports organizations in Michigan serve these children. The Michigan Recreation and Parks Association, for example, provides services in more than 200 communities across the state; it is actively involved in many different types of sport programs, including baseball and Hershey=s Track and Field Programs. Other organizations, such as the American Youth Soccer Organization, serve thousands of children. These and similar organizations could be used to provide information to children on good bone health.

Recommendation 7c:

The Governor's Council on Physical Fitness, Health and Sports, the Michigan Fitness Foundation, Michigan Collaborative Osteoporosis Partnership, the Michigan Consortium for Osteoporosis and the Michigan Department of Community Health should collaboratively:

Develop relationships with various youth-oriented sports organizations throughout the state and develop materials and training protocols to encourage them to provide bone health information.
Issue a concept paper on the importance of physical activity and sports in the development and maintenance of good bone strength. Much of this document should be devoted to youth. A less technical version should be provided to parents.
Encourage not-for-profit and commercial organizations in Michigan to provide bone health-related materials to youth sport programs. The materials should provide a positive message about the importance of calcium, vitamin D, and physical activity for good bone health.

Projected impact:

Most sport organizations provide their coaches with some type of training protocols B rules, regulations, training procedures, etc. If appropriate relationships are forged with organizations such as the Michigan Recreation and Parks Association, American Youth Soccer Organization, and the Michigan Area Hockey Association they could provide bone health-related materials and training, and encourage coaches to pass this information along to the children in their programs.

This contact with young people, coupled with information that is provided to their parents, and messages from not-for-profit and commercial organizations that target young people, will do much to increase awareness of bone health-related issues.

Educating Providers

Provider education is an integral component of any public health campaign. As stated in the Cross Cutting Recommendation 2, increasing provider knowledge about osteoporosis and bone health will decrease the incidence of osteoporotic fractures in the mature adult population. These educational efforts should start in childhood and young adulthood.

Focus statement:

Physicians and other medical and dental providers need time-efficient, low-cost (or free) educational opportunities that offer Category 1 Continuing Medical Education (CME) credit. Any approach that providers can learn about osteoporosis in children and earn Category 1 CME credits will increase the likelihood that young people and their parents will receive appropriate counseling about bone health.

Recommendation 8a:

MDCH or the MCOP should work with appropriate groups to increase the number of opportunities for health care providers serving children and youth to earn Category 1 Continuing Medical Education credits to learn about osteoporosis risk. Methods may include such things as: lecture materials, videos, interactive computer programs, etc.

Projected impact:

By increasing the CME-eligible opportunities for providers, bone health awareness will be increased. This will increase the number of providers who discuss bone health with their patients and thereby increase patient awareness as well.

Recommendation 8b:

MDCH or the MCOP should work with appropriate groups (Michigan Academy of Pediatrics and the Michigan Academy of Family Practitioners) to increase the likelihood that young patients will receive appropriate dietary and exercise guidance for bone health. A mechanism should be created to place in the hands of health care providers who serve children and youth tools that make it easy to offer desired services to their patients, e.g., age appropriate educational materials, risk assessment and other supportive educational tools. In addition, primary care providers should be encouraged to use allied health providers such as registered dietitians and exercise professionals to deliver counseling on diet and exercise.

Projected impact:

Equipping providers to educate patients on bone health will dramatically increase provider and patient awareness.

Recommendation 8c:

Parents should be encouraged to ask their medical, dental provider, pharmacist, and health providers about osteoporosis in order to stimulate the provider to educate himself/herself about risk factors for osteoporosis including dietary, medication, secondary amenorrhea, and diseases that are detrimental to bone health. Educational materials for parents can be provided via pharmaceutical company information, in pharmacies, through public health programs such as WIC, or via schools through written take-home materials sent home with children by physical education and health education teachers.

Projected impact:

By simultaneously educating providers and patients/parents about risk factors for osteoporosis, bone health awareness will increase. This will lead to risk factor reduction for children.

Schools

Focus statement:

Factors in childhood and adolescence that limit one=s ability to achieve an optimal peak bone mass increase the risk of having inadequate bone mass later in life. Therefore, interventions in the first two decades of life to promote optimal accumulation of bone mass are critical for decreasing the risk of fractures later in life.

School physical education classes in Michigan meet on average only twice a week for 30 minutes per session; therefore, merely engaging students in physical activity during this period will not meet the recommendations for weekly physical activity. Physical education class time is more wisely used in preparing students to be active now and in the future. Students who have the appropriate knowledge, attitudes, and motor skills will likely be better equipped to engage in the kind of physical activity that has been shown to contribute to bone health.

Calcium and vitamin D -- needed in adequate amounts to provide for bone development -- are often deficient in the diets of school-aged individuals. Students who understand the importance of ingesting adequate amounts of calcium and vitamin D and are able to select foods that contain these nutrients are better equipped than others to meet the recommended daily allowances. School health classes are an excellent medium for imparting this information, and school lunch programs represent an excellent opportunity for providing foods rich in calcium and vitamin D.

Lifestyle variables that are believed to be major determinants in achieving optimal peak bone mass include physical activity, calcium intake, and vitamin D intake. These recommendations focus attention on the above three variables as they relate to school programming.

Recommendation 9a:

Michigan schools must use proper instruction in physical education and health classes to equip school-age individuals with the knowledge, attitudes, and motor skills needed to participate in regular physical activity (at least 30 minutes per day five or more times per week, at moderate to vigorous intensity). The MDCH and MDE should continue to encourage all Michigan schools to adopt MI-EPEC.

Recommendation 9b:

Michigan schools must equip school-aged individuals with the knowledge of the importance of calcium and vitamin D to bone health, choose foods that contain these nutrients, and meet the recommended daily allowances (see recommended daily allowances in Appendix B). The MDCH and the MDE should review the Michigan Model for Comprehensive School Health lessons related to bone health.

Recommendation 9c:

The MDE should review menus and menu requirements to be sure Michigan schools provide students with school cafeteria meals that are high in calcium and vitamin D.

Projected impact:

If all of Michigan=s schools delivered bone health information and interventions to modify behaviors to optimize peak bone mass, almost 1.7 million students in grades K-12 could be affected. The proportion of Michigan students in Grades K-12 who participate in regular physical activity and whose diets include adequate amounts of calcium and vitamin D will increase as a result of the implementation of these recommendations.

Section III: Young Adult and Middle Age

Educating the Public

See also Cross Cutting Recommendation 1, page 3.

Focus statement:

Young adults and middle-age people should be a high priority for targeting osteoporosis prevention messages. Adults have a direct influence on their young children, their aging parents, and their own need to maintain optimal bone mass.

Educational efforts through the mass media are especially suited to the 21-50 year old population because this group is typically healthy and less likely to have extensive contact with the health care system than younger and older individuals.

Mass media however is not the only relevant route for reaching the young adult and middle age population. Some of the public education effort should be directed toward work sites, since a majority of Michigan adults 21-50 years old spend significant portions of their time at work. Additionally, special efforts should be made to reach this population by nutrition-related programs that serve Michigan=s low-income population. Finally, the issue of osteoporosis prevention at menopause must be directly addressed, since this is a point in life when personal decisions can have a tremendous impact on the preservation of bone mass.

Recommendation 10a: Mass Media

Michigan should conduct a unified media campaign to increase public awareness of the significance of osteoporosis, risk factors for osteoporosis, and preventive actions targeted at the 21-50 age group.

To reach the young adult and middle age audience, the following components of a mass media campaign could be considered:

- Identify a spokesperson for osteoporosis prevention for Michigan, an individual whose name and face is widely recognized and who has great personal credibility among the 21-50 year old population.
- Use a combination of public relations and paid advertising approaches that include local newspapers, magazines, radio and television stations, and billboards, as appropriate.
- Institute a Michigan Osteoporosis Awareness Day -- possibly building on the National Osteoporosis Foundation=s Osteoporosis Awareness Day and utilizing their lace ribbon symbol -- or an alternative attention getting approach. A statewide run or walk could be held on this day. Creation of a logo and slogan that would appeal to this age group. Ultimately the logo could appear on products that promote better bone health.
- If possible, work with neighboring states to allow combining resources and wider exposure for a consistent message. Also, a multi-state campaign might attract major companies as private partners.

Recommendation 10b: Worksites

Michigan should develop educational materials with an osteoporosis logo and slogan for use by major Michigan employers and union groups and should devise methods to make these materials available to Michigan employees. Possible mechanisms include:

- Encouraging major Michigan employers (including the big three auto makers) to include osteoporosis education and prevention in their corporate wellness programs and to facilitate physical activity by employees during the work day (breaks and lunch periods).
- Working with major union groups in Michigan to promote understanding of the personal cost of osteoporosis and the importance of preventive measures and encouraging employee groups to request bone-healthy food choices at the work site and facilitation of exercise by employees during breaks and lunch periods.
- Cooperating with the Employee Health Management Office

of the Michigan Department of Management and Budget to develop a method of offering osteoporosis education to all state employees.

Strengthening osteoporosis prevention for small businesses:

- Developing standards for work site osteoporosis prevention programs.

- Developing training for work site osteoporosis education and prevention.

Developing guidelines for facilitating exercise by employees during breaks and lunch periods via designation of safe walking areas, development of shower facilities on site, offering exercise classes, and offering incentives for documented physical activity.

Including osteoporosis risk factor assessment in work site health screening programs.

Working with retiree groups and organizations to provide educational outreach opportunities related to prevention diagnosis and treatment.

Recommendation 10c: Low-Income Populations

The Michigan Department of Community Health should work with Michigan administrators of U.S. Department of Agriculture programs serving low-income young families to be sure that osteoporosis prevention information reaches their clients. This would include the Women, Infants, and Children (WIC) nutrition program and the Michigan State University Extension Expanded Food and Nutrition Education Program (EFNEP).

Recommendation 10d: Osteoporosis Prevention at Menopause

The Michigan Department of Community Health should develop a state of the science educational brochure that will help women decide among their options related to use of hormone therapy at menopause. Risk factors for heart disease, cancer, and osteoporosis must be included. In order to facilitate discussions between Michigan women and their health care providers, this material must be made widely available to providers and women alike.

Projected Impact:

An increased knowledge base among Michigan citizens 21 to 50 years old will result in better compliance with lifestyle recommendations for

osteoporosis prevention, more informed decision-making for use of estrogen replacement therapy, and enhanced attention by health care providers to osteoporosis risk assessment and treatment.

Educating Providers

Focus statement:

A significant segment of people at risk of osteoporosis in the 21 to 50 year old age group are women of reproductive age and perimenopausal women, who are frequent users of the health care system. Osteoporosis risk factor identification, education, and - where indicated - treatment, should be incorporated into medical practice by all who treat people in the 21 to 50 year old age range. Working with this age group will have spillover effects, since they often are in a position to be especially influential: they can protect their own bone health, they can promote good bone health in their children, and they can help their aging parents minimize risk of osteoporosis.

It is important that all health care providers understand their critical roles in working with the 21 to 50 year old age group to prevent osteoporotic fractures.

See also Cross Cutting Recommendation 2, page 5.

Recommendation 11: Provider Education - Young Adult and Middle Age Group

To increase the likelihood that providers will be able to offer osteoporosis counseling and education:

> Beginning not later than the year 2001 increase the number of health care providers who appropriately counsel their at-risk patients by 20% annually.
>
> The review mechanism developed under Cross Cutting Recommendation 5 (related to the accuracy of osteoporosis patient education materials) should include verification of suitability for the 21 to 50 year old age group.
>
> Patient education materials verified as being accurate and suitable to the 21 to 50 year old age group should be made readily available to health care providers at low or no cost.
>
> In order to promote appropriate screening and treatment, a mechanism for updating providers on Medicare/Medicaid

reimbursement for bone mineral density testing among the 21 to 50 year old age group should be promoted.

When available, the validated osteoporosis risk factor identification tool for people age 21 to 50 years old developed under Recommendation 12 (below) should be made readily available to all health care providers in Michigan.

Projected impact:

A health care system that is more aware of this disease process in the young adult and middle age group can greatly assist in the reduction of fracture rates, hospitalizations, and nursing home admissions. Further societal cost savings are possible, but less directly measurable, by maintaining the productivity and independence of people at risk for fractures and reducing care giver costs.

Risk Assessment Tool

Focus statement:

To reduce the incidence of osteoporotic fractures, individuals who are at risk for loss of bone mass must be identified. Although many risk factors for low bone mass density have been documented, there is no overall risk assessment tool that has been validated for people age 21 to 50 years. Existing weighted risk assessment tools have been validated only for post-menopausal Caucasian women. Few risk assessment tools include consideration of the use of medications such as corticosteroids or retinoids or medical conditions such as hyperparathyroidism.

There are two reasons for developing a validated risk assessment tool. First, it is needed to identify individuals who are at high risk for low bone mass density or who may have already lost bone mass; such individuals may be considered for further diagnostic evaluation. Second, such a tool would be used to identify individuals whose lifestyle, family history, or medical conditions place them at high risk for eventually developing osteoporosis; they should receive specific, focused education for prevention.

Recommendation 12: Risk Assessment Tool

The Michigan Collaborative Osteoporosis Partnership should coordinate the development of a weighted osteoporosis risk assessment tool and validate it for use among adults age 21 to 50 years old. The tool should be

appropriate for self-assessment by interested individuals and suitable for use by health care providers.

The validation process could consider bone mass density as the end point. It should address the question of whether there is cumulative risk from multiple factors such as low calcium intake and sedentary lifestyle, any of which taken alone would have low predictive value for osteoporosis.

Existing research should be used in the development of this tool, including data collected by University of Michigan researchers in Tecumseh, Michigan, which identified subjects with low bone mineral density and documented their characteristics.

Projected impact:

Having a validated risk assessment tool will greatly improve the ability of health care providers to identify individuals who need prevention intervention (i.e., through education, medication, diet change, etc.). There is also potential for saving health care dollars by clearly identifying those who are appropriate candidates for bone mineral density tests.

Section IV: Mature Adult

Educating the Public

Focus statement:

As part of the cross-cutting recommendation to educate the public, specific efforts should target the mature adult to: 1) increase awareness of the osteoporosis disease process and associated risk factors; 2) provide information concerning the availability of diagnostic procedures; and 3) dispel myths about the inevitability of the disease while promoting the positive impact that prevention and treatment can have on the individual.

See also Cross Cutting Recommendation 1, page 3.

Recommendation 14a:

Public and patient awareness of the importance of mature adult risk factor reduction and timely treatment for osteoporosis should be fostered through the offices of physicians and other health care providers. Educational

information should be disseminated from such facilities as schools, community centers, work sites, shopping malls, senior centers, recreational centers, social programs, parks, grocery stores, restaurants, and other public sites.

The materials used should include leaflets, posters, speakers, and videos. The economic, social, and personal costs of osteoporosis should be detailed as part of these efforts. All educational efforts will be more effective if they are culturally and ethnically sensitive. Public educational programs designed to encourage prevention and treatment for those at risk of or diagnosed with osteoporosis should be based on market data research that clearly identifies both barriers and enabling factors for people of both genders, various ethnic groups, and geographic regions. Educational information should be provided to local newspapers, radio and television stations, public access cable television channels, and World Wide Web sites.

Strategies for follow-up to measure the effectiveness of these educational efforts should be developed and implemented.

Recommendation 14b:

Mature adult osteoporosis education should be conducted at the community level using informational meetings and/or support groups, and local public educational programs for the mature adult should be made available to communities of different sizes in an accessible, affordable manner and location.

Regional and state health councils, Michigan State University Extension, area agencies on aging, and local public health departments, in consultation with the National Osteoporosis Foundation, should cooperate in sponsoring local public educational programs on osteoporosis risk reduction and treatment. As noted under Cross Cutting Recommendation 5, a task force of medical experts and health care providers should review educational programs and materials for appropriateness before dissemination to the public. This educational information should define the disease and address the importance of early detection and treatment of osteoporosis. Information should be made available regarding how to identify those who will benefit most from risk reduction, how to talk to physicians about risk, disease prevention measures, and efficacious treatment plans.

Recommendation 14c:

Senior citizen organizations should encourage members to participate in educational activities that promote greater personal responsibility in the prevention and treatment of osteoporosis.

As part of this effort, these organizations should acquire education for their staff members in the areas of good nutrition (particularly dietary calcium and Vitamin D), safe and appropriate activity programs, the availability of treatment, and emotional support for osteoporosis patients.

Projected impact

Since most mature adults are not aware of the risk of osteoporosis or its effects, educational efforts to raise awareness will result in personal assessments of risk, behavior targeted to risk reduction, and reduction of the burden of disease.

Educating Providers

Focus statement:

It is imperative that health care providers be aware of osteoporosis issues across the lifespan, as reflected by the priority placed on Cross Cutting Recommendation 2. Although detection and treatment of osteoporosis is important in all stages of life, it is especially urgent for mature adults.

Low bone mineral density is the cause of the overwhelming majority of mature adult spine and hip fractures and is a major public health problem. Health care providers could play an important role in reducing the prevalence and incidence of osteoporosis if given appropriate information about detecting and treating low bone mass, with or without fractures, to prevent future osteoporotic fractures.

The National Osteoporosis Foundation has issued guidelines for physicians for the prevention and management of osteoporosis, including the appropriate use of bone densitometry with mature adults. The federal Bone Mass Measurement Act (see Recommendation 16 page 32) provides for Medicare reimbursement for bone density measurement on FDA-approved instruments under specified conditions, including estrogen deficiency. It is now feasible to measure most postmenopausal women's bone density and to intervene early in women with osteoporosis and increased fracture risk.

See also Cross Cutting Recommendation 2, page 5.

Recommendation 15:

As a complement to Cross Cutting Recommendations 2 and 5, Michigan Collaborative Osteoporosis Partnership should create a curriculum and slide set for the education of health care and/or bone densitometry providers on issues directly related to serving mature adults.

The ultimate goal would be to train speakers to provide lectures to groups of providers using the common slide set. The curriculum should include, as a minimum, guidelines for the appropriate use of bone densitometry, prevention of osteoporosis in the mature adult, available FDA-approved pharmacologic treatments, and monitoring. The National Osteoporosis Foundation guidelines for physicians would be incorporated as deemed appropriate by the committee. Complementary written materials should be made available for distribution to attendees.

Projected impact

Increasing health care providers= awareness of osteoporosis as a major public health problem and of the availability and appropriate use of detection devices and treatments will decrease the incidence of osteoporotic fractures in the mature adult population. The proportion of cases identified and treated should increase substantially.

The Bone Mass Measurement Act

Focus statement:

Previous lack of reimbursement reduced the availability of bone mass measurement even in cases in which existing patient risk factors would have supported screening.

More specifically, Section 4106 of the Balanced Budget Act of 1997 standardizes Medicare coverage of medically necessary bone mass measurements by providing for uniform coverage under Medicare Part B, as provided under Section 1861(s) (15) of the Social Security Act. The relevant sections took effect July 1, 1998. The section provides that covered bone mass measurement:

> Is performed using radiological or radioisotopic procedure or other procedure (not including Dual Photon Absorptiometry [DPA] or other bone sonometer [i.e., ultrasound device]) approved by the FDA;
>
> Is performed on a qualified individual for the purpose of identifying bone mass or detecting bone loss or determining bone quality; and

Includes a physician=s interpretation of the results of the procedure.

A qualified individual is:

A woman who has been determined to be estrogen-deficient and at clinical risk of osteoporosis based on her medical history or other findings;

An individual with vertebral abnormalities as demonstrated by X-ray to be indicative of osteoporosis, osteopenia, or vertebral fracture;

An individual receiving or expected to receive glucocorticoid therapy equivalent to 7.5 mg. of prednisone, or greater, per day for more than 3 months;

An individual with primary hyperparathyroidism; or

An individual being monitored to assess the response to or efficacy of an FDA-approved osteoporosis drug therapy.

Medicare will cover bone mass measurement for a qualified individual once every two years (at least 23 months since the last test) and, if medically necessary, more frequently (such as monitoring beneficiaries on glucocorticoid therapy for longer than three months).

The National Osteoporosis Foundation thinks these new provisions will greatly increase the availability of screening and the discovery of bone disease. Unfortunately, very few Michigan Medicare beneficiaries and few Michigan physicians appear to be aware of the new Medicare bone density provisions.

Recommendation 16:

The Michigan State Medical Society in cooperation with the Michigan Department of Community Health and other medical professional associations, should publicize the specific provisions of the Bone Mass Measurement Act to all appropriate Michigan health professionals. Further, the Michigan Department of Community Health and the Michigan Office on Aging should develop public education materials to increase the awareness among Medicare beneficiaries of the need for the screening of qualified individuals as defined by the act and of the costs that are covered by the Bone Mass Measurement Act.

Projected impact:

Increasing health professionals= and public awareness of the provisions of the Bone Mass Measurement Act will help ensure that mature adults qualified for bone mass measurement benefits will take advantage of them. Approximately 1.2 million Michigan citizens 65 years of age and older are covered by Medicare Part B.

Insurer / Payer Awareness of Osteoporosis Issues

Focus statement:

Osteoporosis prevention, screening, and treatment is an emerging and dynamic field, with new information, research, and discoveries becoming available almost monthly. As noted elsewhere in this report, there is not currently sufficient support for the efficacy of mass screening or treatment for low bone density among the general population. At the same time, there is an increasing consensus that it is cost- and health-beneficial to screen and/or treat certain populations that are at high risk as a result of family history or other factors.

With most emerging medical specialties or fields, available payer benefits and/or reimbursements for newly developed screening or treatment approaches often lag several years behind proof of the technique's efficacy. Given the substantial evidence that the aging population in Michigan - as in most of the nation - is heading toward significant increases in osteoporosis-related fractures, disability, and death, efforts to shorten the gap between proof of the efficacy and payer reimbursement must be immediately undertaken. Insurers, payers, and patients all benefit when techniques and procedures are identified and covered as soon as their efficacy and cost benefit has been established.

Recommendation 17:

The Michigan Collaborative Osteoporosis Partnership, Michigan's universities and medical schools, and the University of Michigan School of Public Health, should, not less than annually, compile the available emerging literature on the efficacy and cost-effectiveness of osteoporosis screening and treatment and emerging Michigan data on incidence and prevalence of osteoporosis. This information, together with its implications for benefit or coverage changes, should be made available to insurers, payers and health policy decision-makers.

Projected impact:

Michigan could become a national leader in developing a close and effective osteoporosis related partnership among insurers, payers, providers, researchers, and patients. This recommendation will help to

insure a scientifically valid balance between the rapid availability of emerging, cost-effective osteoporosis screening and treatment techniques and the appropriate fiscal responsibilities of insurers and payers. A formal, annual communications link among these groups can help to ensure that Michigan residents have access to proven techniques and technologies and have earlier, more effective identification and treatment.

Adults More Than 80 Years Old

Focus statement:

There are no criteria for bone mineralization and strength in the population of adults more than 80 years old. There is, to date, very little research in this area and no consensus on detection, prevention or care of osteoporosis for the oldest of adults.

Recommendation 18:

In order to establish appropriate goals and levels of bone integrity and mineralization in people more than 80 years old in Michigan, the Michigan Department of Community Health and the Michigan Collaborative Osteoporosis Partnership should convene a workgroup to review and reach a consensus on bone mineralization and strength objectives within the next 24 months. This review should include recommendations on the evaluation and treatment of bone demineralization in the aging male and female. These recommendations should guide the Michigan Department of Community Health, the Michigan Consortium for Osteoporosis, and, ultimately, state health care providers on appropriate future directions in this area.

Projected impact:

Implementation of this recommendation will result in increased understanding of the current state of Michigan=s advanced elderly with respect to bone mineralization and strength, of what expectations we might reasonably hold, and how to achieve them. Quality of life will improve as a result, and there will be more efficient use of health care dollars.

Community Resources

Focus statement:

As large numbers of baby boomers age to become mature, or older adults the MDCH must build the infrastructure referenced in Recommendation 4 to mount a campaign of awareness and interventions focused on

lengthening active life expectancy B the duration of functional well-being with independence in the activities of daily living. Key to this initiative will be the establishment of collaborations among health service organizations, community program planners, and service delivery sites in order to form a statewide system that can reach this older population with programs of osteoporosis awareness, detection, prevention, and treatment.

Recommendation 19:

The Michigan Department of Community Health should initiate or further develop collaborative relationships with other public health agencies, health service organizations, health care provider sites, adult education programs, and other organizations in order to take advantage of established means of delivering health messages and interventions to mature adults.

These collaborations could take a number of forms:

> Osteoporosis-related information can be delivered as an addendum to programs in other health areas that are already in place: National Osteoporosis Foundation, Arthritis Foundation, Chronic Illness Coalition, Alzheimer's Disease and Related Disorders Association, American Heart Association, National Kidney Foundation, National Multiple Sclerosis Society/Michigan Chapter, American Diabetes Association, Older Women's League-Michigan Chapter, and Michigan Menopause Action Team.
>
> Collaborations with other groups, including the Retired Senior Volunteer Program, American Association of Retired People, adult education programs within community school districts, and the YMCA/YWCA, would increase the Department's capacity to deliver osteoporosis education and intervention programs. The programs themselves will be perceived as an added benefit of membership in these organizations.
>
> Other public health agencies could provide the Michigan Department of Community Health a network of existing systems of service delivery within which osteoporosis-related programs can be developed and implemented: Office of Services to the Aging, Area Agencies on Aging Association of Michigan, Older Women's League-Michigan Chapter, and Michigan Association of Senior Centers.

Groups and organizations that offer exercise programs could be an avenue for Michigan Department of Community Health to implement specific exercise programs targeted to osteoporosis prevention and treatment. Such groups would include the Arthritis Foundation, which has established exercise programs (PACE/People with Arthritis Can Exercise; the Arthritis Foundation Aquatics Program; Joint Efforts) currently available at various community sites. These programs have been developed and reviewed by specialists in the field and have known efficacy. The Arthritis Foundation provides leader training and materials for these programs to be implemented in community sites.

Osteoporosis-related programs and activities could be added in many health care provider sites (hospitals and rehabilitation facilities, outpatient physical and occupational therapy units, and others) that have existing exercise and education programs.

Projected impact:

Establishing a network of community sites and community providers through which osteoporosis-related awareness, detection, treatment, and prevention programs can be delivered will result in more mature adults participating in lifestyle interventions focused on lengthening active life expectancy.

Section V: Appendix A

The following material has been adapted from materials on the web sites of the National Osteoporosis Foundation and the National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health and from AToward Better Bone Health: The Michigan Plan, A Foundations Document@.

"Osteoporosis Overview"

Osteoporosis, or porous bone, is a disease characterized by low bone mass and structural deterioration of bone tissue, leading to bone fragility and an increased susceptibility to fractures of the hip, spine, and wrist. Men as

well as women suffer from osteoporosis as do people of all ethnic backgrounds. Osteoporosis is a disease that can often be prevented and treated.

Facts and Figures

Osteoporosis is a major public health threat for 28 million Americans, 80% of whom are women.
In the U.S. today, 10 million individuals already have osteoporosis and 18 million more have low bone mass, placing them at increased risk for this disease.
In Michigan, 810,200 women and 137,800 men are estimated to have osteoporosis.
One out of every two women and one in eight men older than 50 will have an osteoporosis-related fracture in their lifetime.
More than 2 million American men suffer from osteoporosis, and millions more are at risk. Each year 80,000 men suffer a hip fracture and one-third die within a year.
Osteoporosis and osteopenia can affect teens and adults of all ages and all ethnic groups.
Osteoporosis is responsible for more than 1.5 million fractures annually, including 300,000 hip fractures, and approximately 700,000 vertebral fractures, 250,000 wrist fractures, and more than 300,000 fractures at other sites.
Estimated Michigan direct expenditure (hospitals and nursing homes) for osteoporosis and related fractures is $7.1 billion between 1995 and 2015.

What is Bone?

Bone is living, growing tissue. It is made mostly of collagen, a protein that provides a soft framework, and calcium phosphate, a mineral that adds strength and hardens the framework. This combination of collagen and calcium makes bone strong yet flexible to withstand stress. More than 99% of the body=s calcium is contained in the bones and teeth. The remaining 1% is found in the blood.

Throughout your lifetime, old bone is removed (resorption) and new bone is added to the skeleton (formation). Generally, during childhood and teenage years, new bone is added faster than old bone is removed. As a result, bones typically become larger, heavier, and denser. Bone formation continues at a pace faster than resorption until peak bone mass (maximum bone density and strength) is reached during the mid-20s.

Bone mineral density (BMD), a measure of bone mass, changes through the life course. The precise age at which peak bone mass is achieved is unknown. Current hypotheses suggest that peak bone mass may be achieved before the age of 25. Bone mass remains remarkably stable until about 40 to 45 years of age. Then in both sexes there is an age-related decline in bone mass that continues into extreme old age. In women, bone loss is most rapid in the first few years after menopause but persists into the postmenopausal years. Osteoporosis typically develops when bone resorption occurs more quickly than replacement. Osteoporosis is more likely to develop if you did not reach optimal bone mass during your bone building years. When circumstances limit a person=s ability to achieve maximum bone mass, their risk of having inadequate bone mass in later life increases.

Risk Factors

Certain factors are linked to the development of osteoporosis or contribute to an individual=s likelihood of developing the disease. These are called "risk factors." Many people with osteoporosis have several of these risk factors, but some people who develop osteoporosis have no apparent risk factors. There are some risk factors that you cannot change, others that you can, and some that you should discuss with your physician.

Risk factors you cannot change --

> ***Gender*** - Your chances of developing osteoporosis are greater if you are a woman. Women have less bone tissue and lose bone more rapidly than men because of the changes involved in menopause.
>
> ***Age*** - the older you are, the greater your risk of osteoporosis. Your bones become less dense and weaker as you age.
>
> ***Body size*** - Small, thin-boned women are at greater risk.
>
> ***Ethnicity*** - Caucasian and Asian women are at highest risk. African-American and Hispanic women have a lower but still significant risk.
>
> ***Family history*** - Susceptibility to fracture may be, in part, hereditary. People whose parents have a history of fractures also seem to have reduced bone mass and may be at risk for fractures.

Risk factors that you can modify --

A diet low in calcium and vitamin D (and certain other vitamins found in a healthy diet).
Vitamin D through safe exposure to sunlight.
An inactive lifestyle or extended bed rest.
Cigarette smoking.
Excessive use of alcohol.
Chronic endurance exercise

Other risk factors which you should discuss with your physician --

Use of corticosteroids for asthma, lupus or arthritis
Sex hormones - Abnormal absence of menstrual periods (amenorrhea), low estrogen level (menopause), and low testosterone level in men.
Anorexia.
Use of certain medications such as glucocorticoids or some anticonvulsants.
Metabolic bone diseases -- Paget's disease and osteomalacia
Common long term oral treatments for acne

Prevention

To reach optimal peak bone mass and continue building new bone tissue as you get older, there are several factors you should consider:

Calcium. An inadequate supply of calcium over the lifetime is thought to play a significant role in contributing to the development of osteoporosis. Published studies show that low calcium intakes appear to be associated with low bone mass, rapid bone loss, and higher fracture rates. National nutrition surveys have shown that many people consume less than half the amount of calcium recommended to build and maintain healthy bones. Good sources of calcium include low fat dairy products, such as milk, yogurt, cheese and ice cream; dark green, leafy vegetables, such as broccoli, collard greens, bok choy and spinach; sardines and salmon with bones; tofu; almonds; and foods fortified with calcium, such as orange juice, cereals and breads. Depending upon how much calcium you get each day from food, you may need to take a calcium supplement.

Calcium needs change during one's lifetime. The body's demand for calcium is greater during childhood and adolescence, when the skeleton is growing rapidly, and during pregnancy and breastfeeding. Postmenopausal women and older men also need to consume more calcium. This may be caused by inadequate amounts of vitamin D, which is necessary for intestinal absorption of calcium. Also, as you age, your body becomes less efficient at absorbing calcium and other nutrients. Older adults also are

more likely to have chronic medical problems and to use medications that may impair calcium absorption.

Recommended Calcium Intakes (mg/day)	
National Academy of Sciences (1997)	
Ages	
Birth - 6 months	210
6 months - 1 year	270
1-3	500
4-8	800
9-13	1300
14 - 18	1300
19 - 30	1000
31-50	1000
51 - 70	1200
70 or older	1200
Pregnant or lactating	
14 - 18	1300
19 - 50	1000

Vitamin D and Sunlight. Vitamin D plays an important role in calcium absorption and in bone health. It is synthesized in the skin through exposure to sunlight. Though many people are able to obtain enough Vitamin D naturally, studies show that vitamin D production decreases in the elderly, in people who are housebound, and during the winter. These individuals may require vitamin D supplementation to ensure a daily intake of between 400 to 800 IU of vitamin D. Massive doses are not recommended. Anticonvulsant medications may alter both vitamin D and bone mineral metabolism.

Exercise. Like muscle, bone is living tissue that responds to exercise by becoming stronger. The best exercise for your bones is weight-bearing exercise that forces you to work against gravity. These exercises include walking, hiking, jogging, stair-climbing, weight training, tennis, and dancing.

Smoking. Smoking is bad for your bones as well as for your heart and lungs. Women who smoke have lower levels of estrogen compared to nonsmokers and frequently go through menopause earlier. Postmenopausal women who smoke may require higher doses of hormone replacement therapy and may have more side effects. Smokers also may absorb less calcium from their diets.

Alcohol. Regular consumption of 2 to 3 ounces a day of alcohol may be damaging to the skeleton, even in young women and men. Those who drink heavily are more prone to bone loss and fractures, both because of poor nutrition as well as increased risk of falling.

Medications that cause bone loss. The long-term use of glucocorticoids (medications prescribed for a wide range of diseases, including arthritis, asthma, Crohn=s disease, lupus, and other diseases of the lungs, kidneys, and liver) can lead to a loss of bone density and fractures. Other forms of drug therapy that can cause bone loss include long-term treatment with certain antiseizure drugs, such as phenytoin (Dilantin7), barbiturates, and valproate (Depakote7); gonadotropin releasing hormone (GnRH) analogs used to treat endometriosis; excessive use of aluminum-containing antacids; certain cancer treatments; and excessive thyroid hormone. It is important to discuss the use of these drugs with your physician, and not to stop or alter your medication dose on your own.

Prevention Medications. Various medications are available for the prevention, as well as treatment, of osteoporosis. See section entitled "Therapeutic Medications."

Symptoms

Osteoporosis is often called the "silent disease" because bone loss occurs without symptoms. People may not know that they have osteoporosis until their bones become so weak that a sudden strain, bump, or fall causes a hip fracture or a vertebra to collapse. Collapsed vertebra may initially be felt or seen in the form of severe back pain, loss of height, or spinal deformities such as kyphosis, or severely stooped posture.

Detection

Following a comprehensive medical assessment, your doctor may recommend that you have your bone mass measured. Bone mineral density (BMD) tests measure bone density in the spine, wrist, and/or hip (the most common sites of fractures due to osteoporosis), while others measure bone in the heel or arm. These tests are painless, noninvasive, and safe. Bone density tests can:

- Detect low bone density before a fracture occurs.
- Confirm a diagnosis of osteoporosis if you have already fractured.
- Predict your chances of fracturing in the future.
- Determine your rate of bone loss and/or monitor the effects of treatment if the test is conducted at intervals of a year or more.

Treatment

A comprehensive osteoporosis treatment program includes a focus on proper nutrition, exercise, and safety issues to prevent falls that may result in fractures. In addition, your physician may prescribe a medication to slow or stop bone loss, increase bone density, and reduce fracture risk.

Nutrition. The foods we eat contain a variety of vitamins, minerals, and other important nutrients that help keep our bodies healthy. All of these nutrients are needed in a balanced proportion. In particular, calcium and vitamin D are needed for strong bones as well as for your heart, muscles, and nerves to function properly. (See Prevention section for recommended amounts of calcium.)

Exercise. Exercise is an important component of an osteoporosis prevention and treatment program. Exercise not only improves your bone health, but it increases muscle strength, coordination, and balance and leads to better overall health. While exercise is good for someone with osteoporosis, it should not put any sudden or excessive strain on your bones. As extra insurance against fractures, your doctor can recommend specific exercises to strengthen and support your back.

The Therapeutic Role of Medication. Currently, estrogen, calcitonin, and alendronate are approved by the U. S. Food and Drug Administration (FDA) for the treatment of postmenopausal osteoporosis. Estrogen, raloxifene and alendronate are approved for the prevention of the disease.

- **Estrogen.** Estrogen replacement therapy (ERT) has been shown to reduce bone loss, increase bone density in both the spine and hip, and reduce the risk of hip and spinal fractures in postmenopausal women. ERT is administered

most commonly in the form of a pill or skin patch and is effective even when started after age 70. ERT is most commonly taken in women who no longer have a uterus. When estrogen is taken alone, it can increase a woman=s risk of developing cancer of the uterine lining (endometrial cancer).

To eliminate this risk of endometrial cancer in women with an intact uterus, physicians prescribe the hormone progestin in combination with estrogen (hormone replacement therapy or HRT) for those women who have not had a hysterectomy. ERT/HRT relieves menopause symptoms and has been shown to have beneficial effects on both the skeleton and heart.

Experts recommend HRT for women at high risk for osteoporosis. HRT is approved for both the prevention and treatment of osteoporosis. HRT is especially recommended for women whose ovaries were removed before age 50. Hormone replacement should also be considered by women who have experienced natural menopause and have multiple osteoporosis risk factors, such as early menopause, family history of osteoporosis, or below normal bone mass for their age. As with all drugs, the decision to use hormones should be made after discussing the benefits and risks and your own situation with your doctor.

Raloxifene. Raloxifene (brand name Evista & reg;) is a drug that was recently approved for the prevention of osteoporosis. It is from a new class of drugs called Selective Estrogen Receptor Modulators (SERMs) that appear to prevent bone loss at the spine, hip, and total body. Raloxifene=s effect on the spine does not appear to be as powerful as either estrogen replacement therapy or alendronate, but its effect on the hip and total body are more comparable. While side-effects are not common with raloxifene, those reported include hot flashes and deep vein thrombosis, the latter of which is also associated with estrogen therapy. Additional research studies on raloxifene will be ongoing for several more years.

Alendronate. Alendronate (brand name Fosamax7) is a medication from the class of drugs called bisphosphonates. Like estrogen, alendronate is approved for both the prevention and treatment of osteoporosis. In postmenopausal women with osteoporosis, the

bisphosphonate alendronate reduces bone loss, increases bone density in both the spine and hip, and reduces the risk of both spine fractures and hip fractures. Side effects from alendronate are uncommon, but may include abdominal or musculoskeletal pain, nausea, heartburn, or irritation of the esophagus. The medication should be taken on an empty stomach and with a full glass of water first thing in the morning. After taking alendronate, it is important to wait in an upright position for at least one-half hour, or preferably one hour, before the first food, beverage, or medication of the day.

Calcitonin. Calcitonin is a naturally occurring non-sex hormone involved in calcium regulation and bone metabolism. In women who are at least 5 years beyond menopause, calcitonin slows bone loss, increases spinal bone density, and according to anecdotal reports, relieves the pain associated with bone fractures. Calcitonin reduces the risk of spinal fractures and may reduce hip fracture risk as well. Studies on fracture reduction are ongoing. Calcitonin is currently available as an injection or nasal spray. While it does not affect other organs or systems in the body, injectable calcitonin may cause an allergic reaction and unpleasant side effects including flushing of the face and hands, urinary frequency, nausea, and skin rash. The only side effect reported with nasal calcitonin is a runny nose.

Fall Prevention

Fall prevention is a special concern for men and women with osteoporosis. Falls can increase the likelihood of fracturing a bone in the hip, wrist, spine or other part of the skeleton. In addition to the environmental factors listed below, falls can also be caused by impaired vision and/or balance, chronic diseases that impair mental or physical functioning, and certain medications, such as sedatives and antidepressants. It is important that individuals with osteoporosis be aware of any physical changes they may be experiencing that affect their balance or gait, and that they discuss these changes with their health care provider.

Some tips to help eliminate the environmental factors that lead to falls include:

Outdoors. Use a cane or walker for added stability; wear rubber-soled shoes for traction; walk on grass when sidewalks are slippery; in winter, carry salt or kitty litter to

sprinkle on slippery sidewalks; be careful on highly polished floors that become slick and dangerous when wet. Use plastic or carpet runners when possible.

Indoors. Keep rooms free of clutter, especially on floors; keep floor surfaces smooth but not slippery; wear supportive, low-heeled shoes even at home; avoid walking in socks, stockings, or slippers; be sure carpets and area rugs have skid-proof backing or are tacked to the floor; be sure stairwells are well lit and that stairs have handrails on both sides; install grab bars on bathroom walls near tub, shower, and toilet; use a rubber bath mat in shower or tub; keep a flashlight with fresh batteries beside your bed; if using a step stool for hard to reach areas, use a sturdy one with a handrail and wide steps; add ceiling fixtures to rooms lit by lamps. Consider purchasing a cordless phone so that you don't have to rush to answer the phone when it rings or you can call for help if you do fall.